

Appl. No. 10/782,187
Amdt. dated October 26, 2005
Reply to Office action of July 27, 2005

Remarks/Arguments

1. Objections to the Drawings

In the Office action, the drawings were objected to under 37 CFR 1.83(a). More specifically, it was stated that the drawings must show every feature of the invention specified in the claims. Furthermore, it was stated that the features "an imprint head defect", "a support stack defect", "a template defect", and "a substrate defect" recited in claims 5, 8-9, 12, 17, 20-21, and 26 must be shown in the drawings. To that end, Applicants have amended claims 5, 8, 9, 12, 17, and 26 to more clearly define the features "an imprint head defect", "a support stack defect", "a template defect", and "a substrate defect". More specifically, the claims have been amended such that:

- i) "an imprint head defect" is more clearly defined as "a defect associated with an imprint head";
- ii) "a support stack defect" is more clearly defined as "a defect associated with a support stack";
- iii) "a template defect" is more clearly defined as "a defect associated with a template"; and
- iv) "a substrate defect" is more clearly defined as "a defect associated with a substrate".

Furthermore, the Applicants have included additional Fig. 14 such that the feature "defect" is shown in the drawings. Furthermore, Fig. 14 merely gives illustration of subject matter previously recited in the written description of the invention. See ¶[0039]. As a result, no new matter has been introduced by this amendment and no prior art necessitated this amendment. Also the written specification has been amended such that a reference to additional Fig. 14 is made therein. No new matter has been

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introduced by this amendment and no prior art necessitated this amendment.

2. Objections to the Claims

In the Office action, claims 8 and 9 were objected to as allegedly having insufficient antecedent basis. More specifically, claim 8 was objected to for having insufficient antecedent basis for the limitations "a template defect" and "an imprint head defect"; and claim 9 was objected to for having insufficient antecedent basis for the limitations "a support stack defect" and "a substrate defect". To that end, Applicants deem it necessary to clarify the above-mentioned objection under 35 USC section 112.

a. *35 USC section 112, paragraph 1*

The limitations of "a template defect" and "an imprint head defect" of claim 8 and the limitations of "a support stack defect" and "a substrate defect" of claim 9 are given antecedent basis in the Detailed Description of the Invention. More specifically "a template defect" is recited in ¶[0033]; "an imprint head defect" is recited in ¶[0030]; "a support stack defect" is recited in ¶[0034]; and "a substrate defect" is recited in ¶[0035]. As a result, it is respectfully contended that claims 8 and 9 comport with the provisions of 35 USC section 112, paragraph 1.

b. *35 USC section 112, paragraph 2*

The limitations of "a template defect" and "an imprint head defect" of claim 8 and the limitations of "a support stack defect" and "a substrate defect" of claim 9 are cited for the first time therein. To that end, Applicants utilized the indefinite article 'a' or 'an' to introduce the above-mentioned

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limitations. As a result, it is respectfully contended that claims 8 and 9 comport with the provisions of 35 USC section 112, paragraph 2.

3. Rejections under 35 USC section 102

In the Office Action, claim 1 was rejected pursuant to 35 USC section 102(b) as allegedly being anticipated by United States Patent 4,444,801 to Hongo et al. [hereinafter referred to as Hongo]. To summarize the standard, rejections under section 102 are proper only when one prior art reference discloses every feature of the claimed invention so that there is no physical difference between the reference and the claimed invention. See *In re Marshall*, 198 USPQ 44 (CCPA 1978). In addition, inchoate in any rejection pursuant to 35 USC section 102 is an obviousness rejection pursuant to 35 USC section 103. As a result, Applicants address any inchoate obviousness rejections along with the rejections under 35 USC section 102.

a. Claim 1

Claim 1, as amended, defines a method for measuring characteristics of a film disposed on a substrate, the method including, *inter alia*, identifying a plurality of processing regions on the film; measuring characteristics of a subset of the plurality of processing regions, defining measured characteristics; determining a variation of one of the measured characteristics; and associating a cause of the variation based upon a comparison of the one of the measured characteristics to measured characteristics associated with the remaining processing regions of the subset.

Hongo does not teach measuring characteristics of a subset of a plurality of processing regions and comparing one of the measured

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characteristic with the measured characteristics associated with the remaining processing regions of the subset. Rather, Hongo teaches comparing measured characteristics associated with a single processing region temporally. This is seen throughout the description of the invention of Hongo. More specifically, Hongo applies a material to a surface of a photomask, the photomask comprising a defect portion; and exposing the defect portion to a light to deposit the material on the defect portion, and thus, correcting the defect portion. To that end, a quantity of the light transmitted through the defect portion varies during the deposition of the material and, as a result, may be used for end point detection of the exposure of the light. More specifically, when the quantity of light transmitted through the defect portion falls below a certain level relative to the quantity of light when the exposure was started, the exposure may be halted or terminated. See column 1, lines 35-50. To that end, Hongo compares the quantity of light transmitted through the defect region when the exposure is started versus a quantity of transmitted light thru the defect region at a subsequent first time; and further compares the quantity of transmitted light thru the defect region at the first time versus a quantity of light transmitted thru the defect region at a subsequent second time. See column 6, lines 20-31. As a result, a signal based upon the above mentioned comparisons may be generated to terminate exposure of the light. To that end, in order to determine when exposure of the light may be halted or terminated, the quantities of light transmitted through the defect region are be compared over substantially the same location, i.e., Hongo compares the measured characteristics [the quantity of light] at a single processing region of the photomask temporally. Thus it becomes clear that Hongo does not teach Applicants' claimed invention of measuring characteristics of a subset of a plurality of

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processing regions and comparing one of the measured characteristic with the measured characteristics associated with the remaining processing regions of the subset.

Moreover, were Hongo modified to include Applicants' claimed invention, Hongo would not be able to determine when exposure of the light may be halted or terminated. More specifically, were Hongo to compare the quantity of light transmitted through one defect portion of the photomask with the quantity of light transmitted through the remaining defect portions of the photomask, Hongo would be unable determine when the quantity of light transmitted falls below a certain level relative to the quantity of light transmitted when the exposure was started, as desired.

Based upon the foregoing, Applicants respectfully contend that Hongo does not anticipate the invention defined by claim 1, as amended, and *prima facie* case of obviousness is not present with respect to claim 1.

b. Claim 16

Claim 16 defines a method for measuring characteristics of a film disposed on a substrate, said method including, *inter alia*, identifying a plurality of processing regions on said film; measuring characteristics of a subset of said plurality of processing regions, defining measured characteristics; determining an anomaly among said measured characteristics; and associating a source of said anomaly based upon a comparison of said anomaly in said measured characteristics with characteristics in the remaining of said processing regions.

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Applicants respectfully contend that the argument set forth above with respect to claim 1 applies with equal weight here and that claim 16 defines an invention suitable for patent protection.

4. Rejections under 35 USC section 103

a. *Claim 11*

In the Office Action, claim 11 was rejected pursuant to 35 USC section 103 as allegedly being unpatentable over Hongo in view of United States Patent 5,774,574 to Hoki [hereinafter referred to as Hoki].

Claim 11, as amended, defines a method for measuring characteristics of a film disposed on a substrate, said method including, *inter alia*, identifying a plurality of processing regions on said film; measuring characteristics of a subset of said plurality of processing regions, defining measured characteristics; obtaining a mean value and a standard deviation from said mean value for one of said measured characteristics; determining a variation of said one of said measured characteristics by comparing said standard deviation with a predetermined threshold; and associating a cause of said variation based upon a comparison of said one of said measured characteristics to measured characteristics associated with the remaining processing regions of said subset.

Applicants respectfully contend that the argument set forth above with respect to claim 1 applies with equal weight here and that claim 11 defines an invention suitable for patent protection.

b. *Claim 23*

In the Office Action, claim 23 was rejected pursuant to 35 USC section 103 as allegedly being unpatentable over Hongo in view of

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United States Patent 6,334,960 to Willson et al. [hereinafter referred to as Willson].

Claim 23 defines a system for measuring characteristics of a film disposed on a substrate, said system including, *inter alia*, a substrate support stack; a substrate disposed on said substrate support stack; an imprint head; a template disposed on said imprint head; a sensing system; and a means for identifying a plurality of processing regions, a subset of which has characteristics associated therewith, and ascertaining a cause of an anomaly in characteristics of one of said plurality of processing regions by comparing of the characteristics of said one of said plurality of processing regions with characteristics associated with the remaining processing regions of said subset.

Applicants respectfully contend that the argument set forth above with respect to claim 1 applies with equal weight here and that claim 23 defines an invention suitable for patent protection.

5. The Non-obviousness of the Dependent Claims

Considering that the dependent claims include all of the features of the independent claims from which they depend, these claims are patentable to the extent that the independent claims are patentable. Therefore, Applicant respectfully contends that the dependent claims define an invention suitable for patent protection.

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Applicants respectfully request examination in view of the remarks. A notice of allowance is earnestly solicited.

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Signed: 

Typed Name: Michael D. Carter

Date: 10/26/2005

Respectfully Submitted,



Michael D. Carter
Reg. No. 56,661
Registered Patent Agent
Legal Department
Molecular Imprints, Inc.
P.O. Box 81536
Austin, Texas 78708-1536
Telephone: 512-339-7760
Facsimile: 512-491-8918